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EXAMINER

NGUYEN, N

ART UNIT

PAPER NUMBER

1754

11

04/24/00

DATE MAILED:

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on Feb 7, 2000 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire three (3) month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 24-31 are pending in the application.
Of the above, claims _____ are withdrawn from consideration.
2. ☒ Claims 1-23 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 24-31 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☒ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified ^{Copies} ~~copy~~ has ☒ been received ☐ not been received
☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

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DETAILED ACTION

Applicant's election of species C-F and alumina-nickel oxide in Paper No. 6 (filed July 26, 1999) is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The corrected or substitute drawing was received on February 7, 2000. This drawing is objected to because in Figure 1, the arrow for the "exhaust gas 7" appears to point to the wrong direction (note page 16, lines 10-12 of the instant specification, "the resulting exhaust gas 7... is discharged to the system outside". Correction is required.

The claims 24-31 are rejected under 35 U.S.C. 112, first and second paragraphs, as the claimed invention is not described in such full, clear, concise and exact terms as to enable any person skilled in the art to make and use the same, and/or for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 24, it is unclear what is required by "at least aluminum and nickel as metallic components", the aluminum and nickel are required to be in metallic form or they are required to be in oxide form even though they are themselves "metals". If the former is true, it is unclear if

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the metallic form can hydrolyze the fluorine compound because all the exemplified catalysts in the instant specification are in oxide form. Also, the dependent claims 25-27 would fail to further limit claim 24 because these dependent claims require oxides of aluminum and nickel.

Claims 24-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 24, "showing a higher decomposition activity" is indefinite because it is unclear "higher" as compared to what. Since the fluorine is removed by hydrolysis, water vapor, i.e. steam is required, thus, it appears that any catalyst in the claimed process would have higher decomposition activity when steam is present.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 24-28, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lercher et al (5,710,359).

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Lercher '359 discloses a process for the degradation of chemical compounds which have one or more heteroatoms X, with X being F, Cl, Br, I, N, O or S, by cleavage of the C-X carbon-heteroatom bonds, wherein the chemical compounds or articles which contain the chemical compounds are treated with water vapor in the presence of an aluminum catalyst at 300°-600°C (note abstract and claim 1). The temperature range overlaps the claimed ranges. The C-X carbon-heteroatom bonds are bonds of the group C-F, C-Cl, among others (note paragraph bridging columns 1 and 2). The C-F bond as disclosed in Lercher '359 fairly suggests that C-F compounds, such as CF_4 , C_2F_6 , etc. can be degraded by the process of Lercher '359. The source of the C-F compounds is not seen as a patentable difference because C-F compounds from any source would still be degraded in the same manner in the process of Lercher '359.

The aluminum catalyst is a catalyst containing an aluminum compound such as aluminum oxide, AlOOH (which fairly suggests boehmite), aluminosilicate or spinels as active constituent. In addition, the catalyst can also contain other metals such as silver, copper, iron, cobalt, nickel, titanium, etc. preferably in the form of their oxides. Particular preference is given to a catalyst consisting of aluminum oxide or containing aluminum oxide as the main component. Lercher '359 does not specifically disclose the amount of the other metal oxide used in the aluminum oxide catalyst, however, it would have been obvious to one of ordinary skill in the art to optimize the amount of the other metal oxide to obtain the best results, i.e. to effectively degrading the C-F bonds in the chemical compounds, *In re Aller* 105 USPQ 233.

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In the process of Lercher '359, the chemical compounds are hydrolyzed by the steam, in the presence of the catalyst to form an acid (note Example 1), HCl content is determined by passing the product gas through a water condenser, a cold trap than a NaOH charge.

It would also have been obvious to one of ordinary skill in the art to optimize the temperature in the treating step of Lercher '359 based upon the chemical compound to be degraded to effectively cleaving the C-X bonds in these compounds.

The examiner takes Official Notice that the use of an alkaline wash solution to remove the acid formed is known and conventional in the art.

The difference is the number of chemical compounds which are suitable to be degraded by the process of Lercher '359 is too large for anticipation.

It would have been obvious to one skilled in the art to select any chemical compound among the specifically disclosed compounds, Merck & Co. Inc. v. Biocraft Laboratory Inc. 10 USPQ 1846.

Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lercher '350 as applied to claims 24-28, 31 above, and further in view of Rosenbaum (5,460,792).

The difference not yet discussed is Lercher '350 does not disclose the addition of zinc oxide.

Rosenbaum '792 discloses a process for the destruction of hydrocarbon compounds which uses a catalyst comprising a carbonaceous pyrolyzed resinous polymer. The catalyst is doped

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with a compound selected from the group consisting of metal oxides, metal oxyhalides or precursor metal salts wherein the metal of the metal oxides, metal oxyhalides and precursor metal salts is selected from the group consisting of Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Co, Zn, Pd, Nb, Zr, Mo and mixtures thereof (note claim 1). Rosenbaum '792 further discloses that the process can be used for the destruction of organic compounds which refer to either halogenated organic or hydrocarbon compounds or mixture thereof (note column 4, lines 15-18). Exemplified compounds which can be destroyed are C_2Cl_4 , CCl_4 (note column 6, lines 6 and 9), Rosenbaum '792 teaches that the halide can be any halide, while chlorine and bromine are being preferred (note column 7; lines 28-26).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to further include zinc in the catalyst of Lercher '359 because Rosenbaum '792 suggests that zinc, just as nickel, would promote the destruction of the halogenated hydrocarbon.

Claims 24-28, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene (5,414,201).

Greene discloses a process for the oxidation of volatile organic compounds. The process uses the steps of:

a) adsorbing at least one organic compound in at least a first catalyst capable of adsorbing the organic compound at an adsorption temperature;

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- b) heating at least one second catalyst downstream of the first catalyst, from an initial temperature to an oxidation temperature, the second catalyst capable of oxidizing the organic compound when heated to the oxidation temperature;
- c) heating the first catalyst to a desorbing temperature at a rate which will permit the complete oxidation of the desorbed organic compound by the second catalyst at the oxidation temperature;
- d) cooling the first catalyst to the first adsorption temperature;
- e) cooling the second catalyst to the initial temperature (note claim 1).

The second catalyst is selected from the group consisting of at least one metal-exchanged aluminosilicate zeolite having at least one exchanged metal, at least one-metal impregnated aluminosilicate zeolite having at least one impregnated metal, and at least one metal exchanged metal-impregnated aluminosilicate zeolite having at least one exchanged metal and at least one impregnated metal, and wherein the impregnated metal is selected from the group consisting of Ti, V, Cr, Mn, Co, Ni, Cu, Fe, Mo, Mn, Pd and Pt (note column 4, lines 10-34 and claim 13).

When the catalyst is a metal-impregnated aluminosilicate zeolite and the impregnated metal is Ni, the Ni would be presence in the catalyst in the form of oxide, because based on the processes disclosed in Greene, after the zeolite catalyst is impregnated, the catalyst is calcined (note columns 5-6, under "Catalyst preparation").

The types of halogenated organics for which the catalysts as mentioned above are above are able to oxidize include fluoromethane, i.e (CF₄) among others (note column 9, lines 7-33,

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especially, lines 26-27). The temperature of second catalyst is from about 150 to about 600°C (note claim 3).

For the dependent claims, note the reasons as stated above.

It is noted that the dependent claim drawn to a method for making the reactant is given little weight in absence of a showing of criticality as alumina made by any process would be expected to perform the same function in the process.

The difference is Greene does not exemplify the use of zeolite (i.e. alumina containing material) with impregnated Ni for oxidizing C-F compounds, i.e. the number of preferred embodiments is too large for anticipation.

It would have been obvious to one skilled in the art to select any combination among the specifically disclosed compounds, *Merck & Co. Inc. v. Biocraft Laboratory Inc.* 10 USPQ 1846.

Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene '201 as applied to claims 24-28, 31 above, and further in view of Rosenbaum '792.

Greene '201 does not disclose the presence of zinc in the catalyst.

Rosenbaum '792 is applied as stated above to teach the desire of adding zinc to the catalyst.

Applicant's arguments filed February 7, 2000 have been fully considered but they are not persuasive.

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Applicants argue that Lercher do not disclose or suggest the decomposition treatment of a gas containing fluorine compounds such as CF_4 , etc.

Since Lercher fairly teaches that the process can be used to cleavage the C-X bond, including C-F bond (note column 4, lines 18-20), it would have been obvious to use the process of Lercher to remove by breaking the C-F bond of any C-F compounds, including those required in Applicants' claims.

Applicants argue that the catalyst of Lercher consists essentially of catalytically active aluminum oxide or AlOOH as the active constituent.

It should be noted that Lercher also teaches that other metals such as nickel, preferably in the form of oxide can be included in the catalyst (note column 3, lines 10-16).

Applicants argue that in Green, "a catalyst containing Al and Ni as metallic components cannot be obtained".

It is unclear what are intended by "metallic components" (note the above 112 rejection). In Greene, the catalyst is both metal-exchanged and metal-impregnated zeolite. When such catalyst is heat treated, the exchanged metal remains in metallic form, however, the impregnated metal is converted to oxide form.

Applicants argue that the reaction in Greene '201 is oxidation while in the claimed process, hydrolysis is conducted.

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It should be noted that Green '201 discloses that water vapor is present in the reaction (note Example #1), thus, there would be at least some hydrolysis reaction in the process of Greene '201.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


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Any inquiry concerning this communication should be directed to Ngoc-Yen Nguyen at telephone number (703) 308-2536.

The fax phone number for this Group is (703) 305-3599 (for OFFICIAL faxes).
UNOFFICIAL fax can be sent to (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

N. M. Nguyen
April 21, 2000


N. M. Nguyen
Primary Examiner
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